



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

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## 2018 Long-Term Stewardship Conference

# TRAC: Use of Story Maps for Transitioning Sites to Long-Term Stewardship

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# Tracking Restoration And Closure (TRAC)



- EM transitioning from paper report to online resource for groundwater plume reporting
- TRAC story maps describe
  - Groundwater plume footprint (above MCL)
  - Cleanup progress
  - Regulatory status

Paducah Gaseous Diffusion Plant: Plume Map



Paducah Gaseous Diffusion Plant: Plume Assessments

Site	Contaminant	Plume Area	MSL	Water Column (ppm)	Current Plume Size	Source	Plume Status	Remedial Action	Regulatory Status	Comments
Paducah Plant	Trichloroethylene, Trichloroethene	100	100	100	100	100	100	100	100	Pump & treat remedial action is underway. Concentration of plume has decreased. Current and future (10 years) concentration is comparable to background levels. Plume is expected to be reduced to 100 ppb or below.
Paducah Plant	Trichloroethylene, Trichloroethene	100	100	100	100	100	100	100	100	Plume and new remedial action is underway. Pump & treat remedial action is ongoing. Plume (PMT) source control action is being taken. Current and future (10 years) concentration is expected to be reduced to 100 ppb or below.
Paducah Plant	Trichloroethylene, Trichloroethene	100	100	100	100	100	100	100	100	Plume remedial action is ongoing. Plume is expected to be reduced to 100 ppb or below.

**Map Conventions:** Contaminant plume area is shown in map legend. Plume area is shown in map legend. Plume area is shown in map legend.

**Plume Area (Square Feet):** Plume area is shown in map legend. Plume area is shown in map legend. Plume area is shown in map legend.

**Source:** Source is shown in map legend. Source is shown in map legend. Source is shown in map legend.

**Plume Status:** Plume status is shown in map legend. Plume status is shown in map legend. Plume status is shown in map legend.

**Regulatory Status:** Regulatory status is shown in map legend. Regulatory status is shown in map legend. Regulatory status is shown in map legend.

**Plume Remedial Action:** Plume remedial action is shown in map legend. Plume remedial action is shown in map legend. Plume remedial action is shown in map legend.


# Goals



- Provide consistent information for each site
- Summarize information across all sites within the EM complex
- No data download access
- Capabilities
  - Maps that are easy to explore
  - Single or multiple contaminant views
  - Single or multiple management unit view
- Ease transition to Legacy Management


# Summary Data View for All DOE-EM Sites



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DOE-EM Complex

Contaminants	Acres
+ Cesium	TBD
+ Chromium (VI)	2251
+ Iodine-129	16137
+ Mercury	2199
+ Strontium-90	1061
+ Technetium-99	623
+ Trichloroethylene	6224
+ Uranium	318



Map showing the United States and surrounding regions (Canada, Mexico, Central America, Caribbean Sea). DOE-EM sites are highlighted in green. Key sites labeled include Hanford, Lawrence Livermore, Los Alamos, Pantex Plant, Oak Ridge, and Savannah River. Major cities like Washington, D.C., New York, and Mexico City are also marked.

Overview



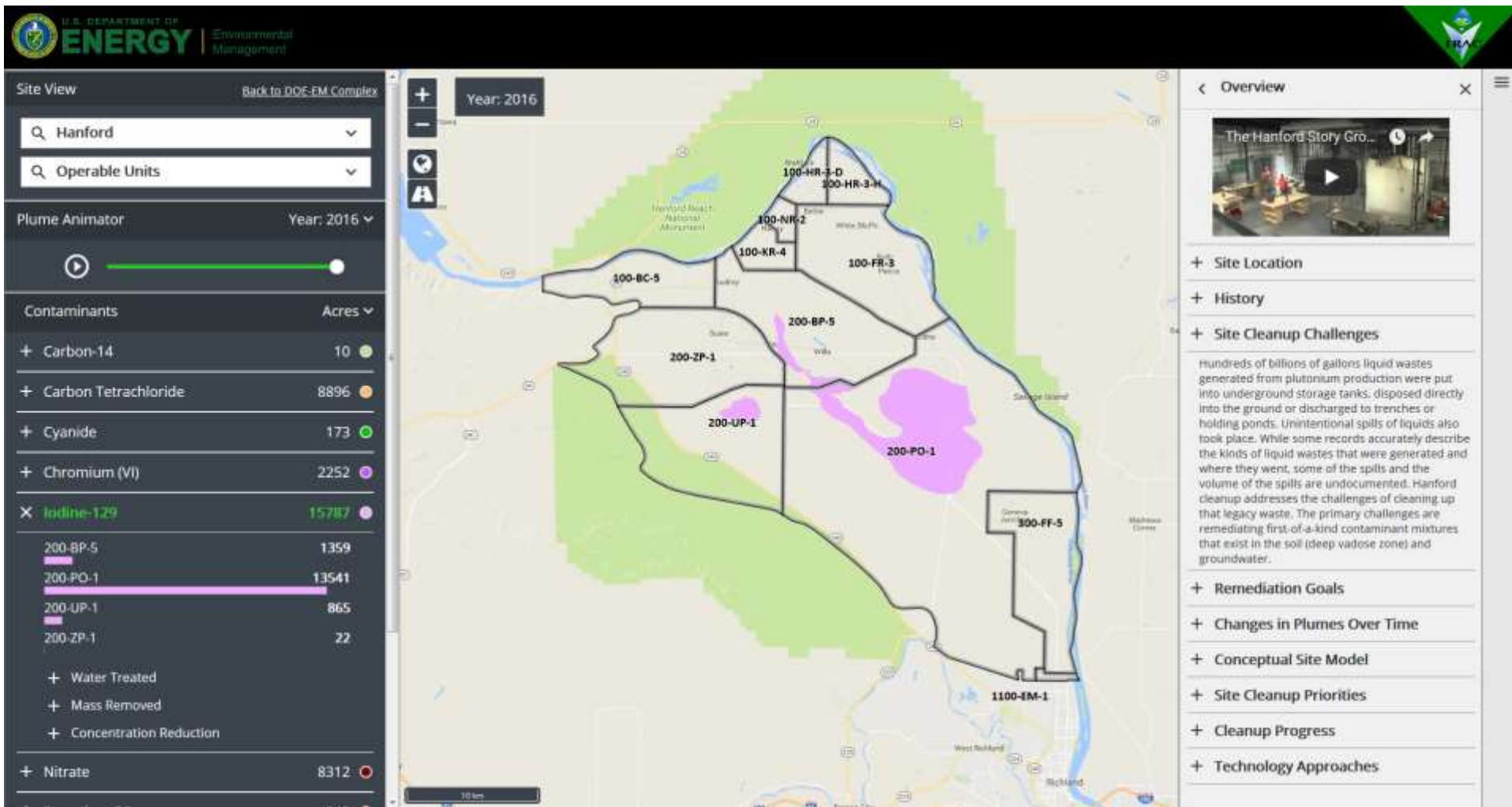
Site Overview

The Department of Energy Office of Environmental Management (DOE EM) is responsible for the cleanup and closure of legacy nuclear waste sites and is charged with the largest environmental cleanup program in the world. EM has made substantial progress in nearly every area of nuclear waste cleanup completing cleanup at 91 of 107 sites. The interactive maps and data on active groundwater cleanup sites are provided in these web pages to show progress toward cleanup and site closure, and the remaining contaminants in groundwater above regulatory maximum contaminant levels (MCL).

- + Office of Environmental Management (EM)
- + History of Nuclear Weapons Production
- + Groundwater and Soils Cleanup Challenges
- + Cleanup Progress
- + Accelerated Closure

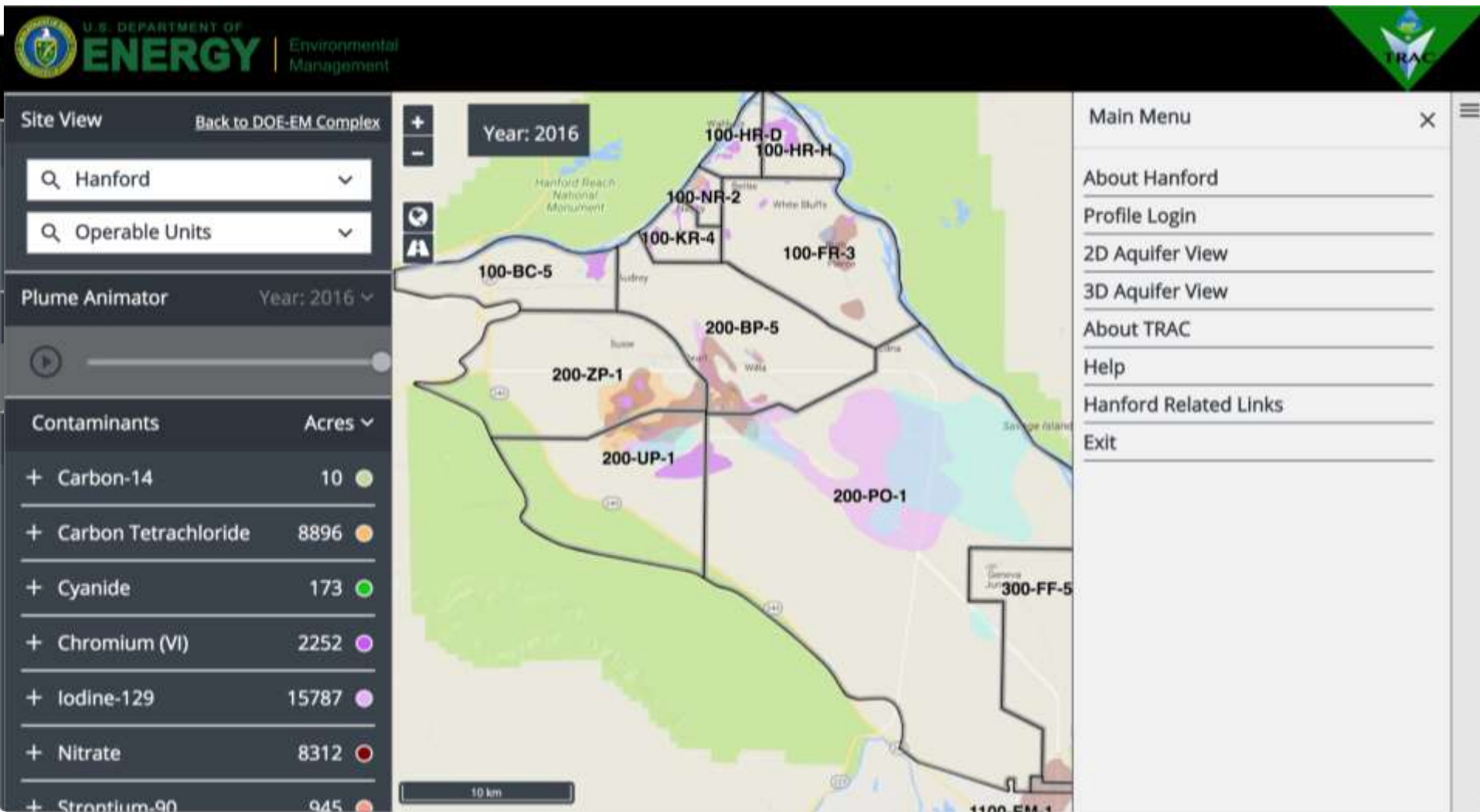
5

# Site Data View

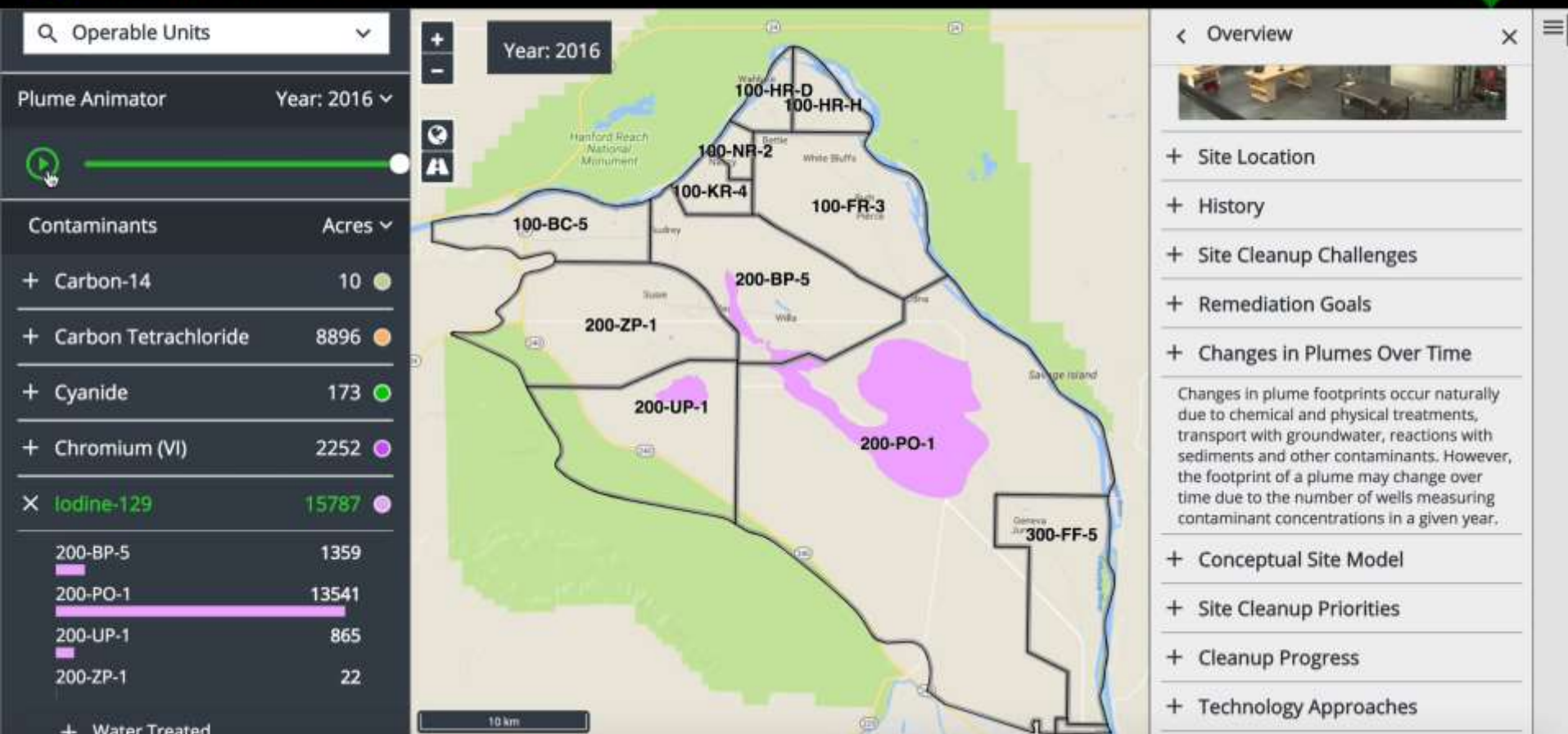




# Aquifer Depth and Thickness

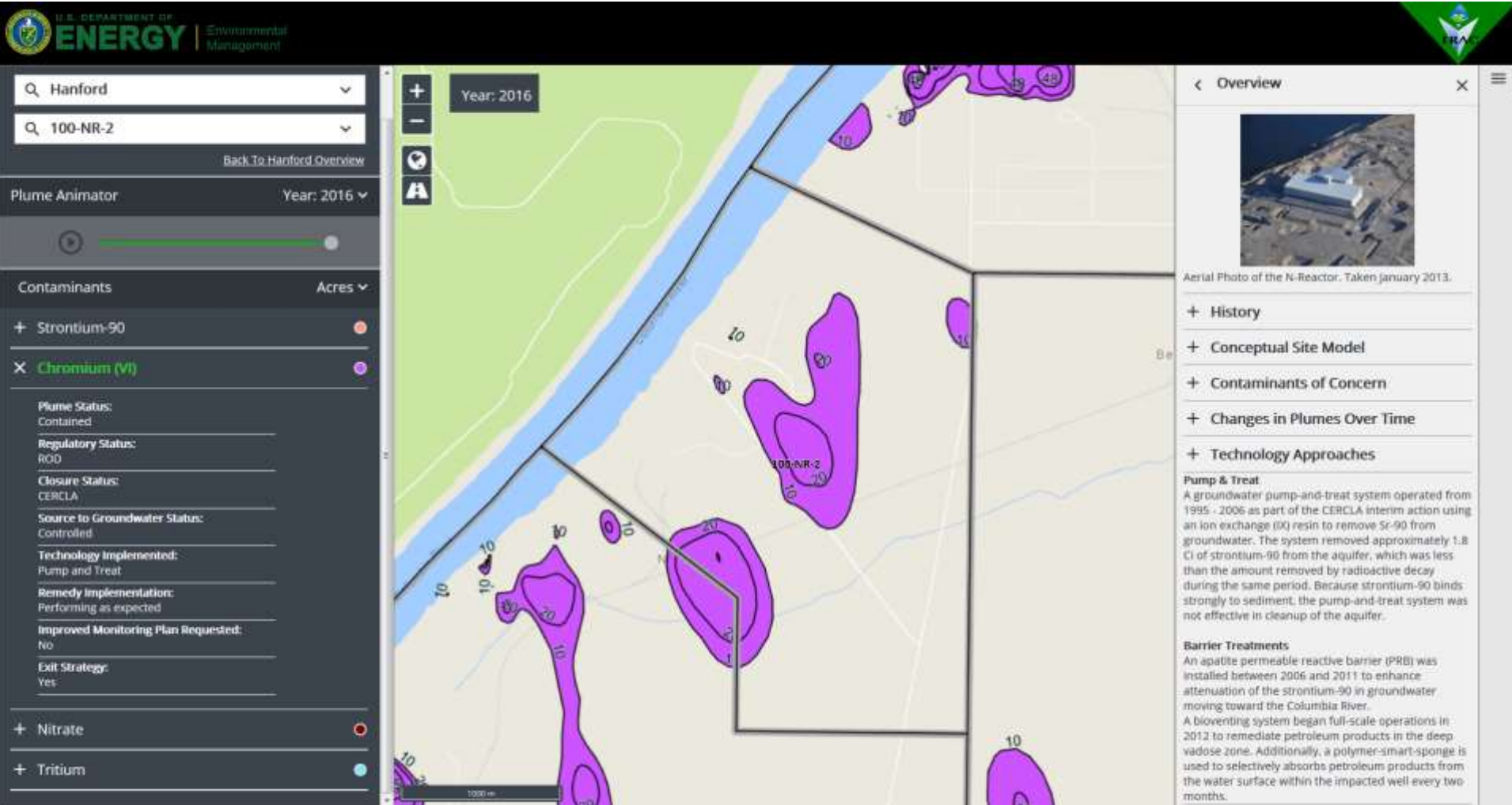


# Plume Animator





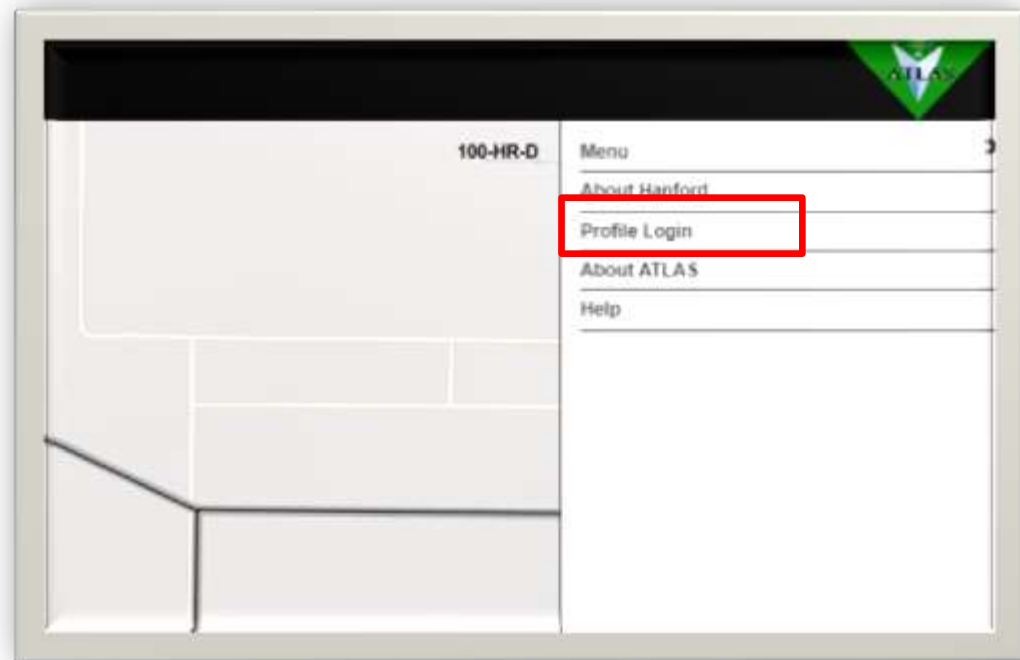
# Management Unit View



# User Login and Profile Management







- Identity management platform
  - Site managers
  - DOE managers
  - Stakeholders and regulators




# Site Data Upload



**Data Collection**    

Test Hanford 2018-01-27 11:30:04

**Site and Plume Status Information**  [Review](#)

**+ Site and Plume Status Information**

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**Site \***


**Management Unit \***

**Year \***

**Regulatory Status**

**Contaminant \***

 Remove Field

 Add Item

**Plume Status**

**Comments**

**Source to Groundwater Status**

**Comments**

**Technology Implemented**

**Comments**

**Remedy Implementation**

# Customized Access



- DOE managers
  - Information on technology development
  - Short and long-term planning
  - Manage roles and permissions, and develop data management workflow and approval process
- Stakeholders and regulators
  - Links to site documentation
  - Decision status

Access Profiles

Active Access Profile: None None Console Only

Apply Cancel

Access Profile Table

<input type="checkbox"/>	Access Profile Name
<input type="checkbox"/>	Console Only

Add... Delete

Profile Rules Table



# Technical Approach

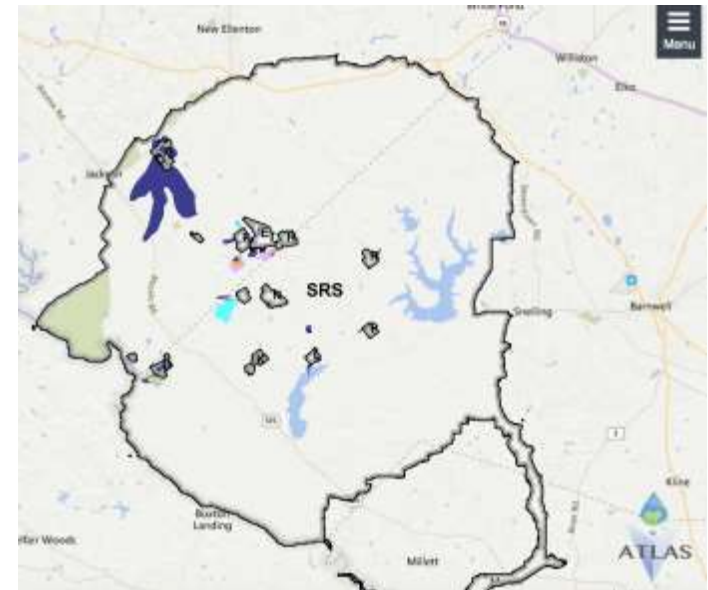
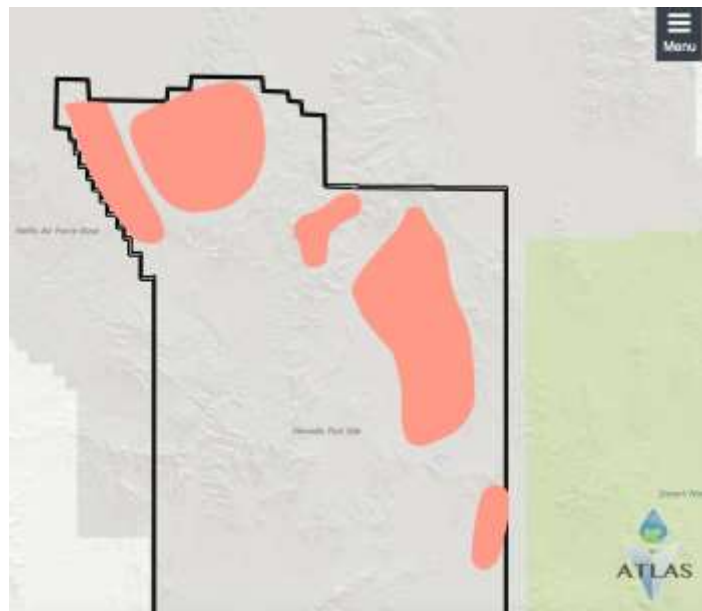


- Client-side and Server-side partitioning of program logic
  - Client-side: libraries and code in the user's browser
  - Server-side: data ingestion, curation, and management that “serves” data to the application
- Modular, custom single-page application framework
  - OpenLayers for mapping (<https://openlayers.org/>)
  - React-Redux libraries (<https://reactjs.org/> and <https://redux.js.org/>)
  - JavaScript libraries (<https://www.javascript/>)
  - GeoServer used for server-side spatial data
  - MS SQL, ASP.NET Web API used for non-spatial data



# Integration of All DOE-EM Sites

- Build Hanford prototype first to minimize data requests from sites
- Solicit requests for plume maps from site offices
- Perform periodic reviews with site offices to solicit feedback



# Minimal Maintenance Costs

- User provides data uploads, which requires little to no interaction for the site owner
- Server-side security updates
- Status changes automatically updated in TRAC



# Summary



- Provides an online information resource for DOE-EM sites that supports EM programs and mission (e.g., TD, SBIR, MSIPP)
- Offers a consistent framework for presenting groundwater data and can promote sharing of technologies, successes, and lessons learned
- Facilitates effective communication with headquarters and DOE sites, as well as regulators and stakeholders
- Offers a potential integration point for transition sites from EM to LM once a site has reached closure